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Blockchain Technology and Competition Policy - Issues paper by the Secretariat

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Blockchain Technology and Competition Policy[*]

1. Introduction

1.   Blockchain is a general-purpose technology that threatens to disrupt markets and institutions across the world. Where the internet enabled the publishing and digital transfer of information, blockchain authenticates the ownership of assets, makes them unique, traceable, and facilitates the digital transfer and hence trading of assets by providing trust in the transaction and reducing uncertainty (through its use of trustworthy self-executing code).

2.   The most prominent example of a blockchain thus far is Bitcoin, a cryptocurrency that uses blockchain technology to act as an alternative payment system. Bitcoin is a non-permissioned or public blockchain, meaning that there is no restriction on who can spend bitcoin or take part in verifying the authenticity of blocks of transactions in the blockchain (an energy intensive process known as 'mining'). These miners are rewarded with a token, in this case a Bitcoin, and the blockchain is transparent in the sense that everyone can view the chain (though identities are anonymised). Largely as result of this anonymity, Bitcoin has proved controversial and been banned in some countries. However, it is worth noting that many concerns around Bitcoin's anonymity and energy usage are characteristics of Bitcoin and not necessarily the wider blockchain technology.

3.   However, blockchain technology potentially serves a much broader range of purposes. In many cases, these alternative applications might be permissioned or non-public blockchains, meaning that only those with authorisation can verify the authenticity of blocks in the blockchain. They may also be non-transparent, and only viewable by those with a private key to the blockchain. These restrictions reduce the decentralised nature of the blockchain, and may increase confidence in its manageability. However, they may also risk reducing it to a simple distributed database, without the same benefits in terms of traceability and irreversibility.

4.   For governments, the adoption of blockchain technologies might include: helping enforcers to clamp down on avoidance of tax and other laws and regulations; to support monetary and fiscal policy via sovereign-backed cryptocurrency; to create digital land titling and other registries, to help citizens prove their identity and vote, and to increase the efficiency and transparency of public services. Pension and social security payments might be made more cheaply and transparently via blockchain, while health records might be shared securely between a patient and all relevant doctors.

5.   Outside of government, its adoption might lead to the bypass of intermediaries, greater information for consumers, and transactions that are more efficient. Firms could disaggregate their different departments and outsourcing more of them to specialists or individuals (since transaction costs between these different units will fall). It may also offer SMEs an efficient and trusted way of trading with consumers, and hence remove barriers due to existing economies of scale. It therefore provides both a route to growth for efficient SMEs, and the prospect of more intensely competitive markets, each of which are likely to help make growth more inclusive. By being able to track real assets,

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[*] This issues paper was written by Chris Pike with comments from Antonio Capobianco and Antonio Gomes of the OECD Competition Division.

businesses could also provide assurance to consumers over the provenance of goods, and strengthen supply chain due diligence.

6.   At the same time, the adoption of blockchain poses some regulatory challenges for governments. These will need to co-operate to develop a consistent regulatory framework that enables businesses to innovate and develop the technology in a competitive environment, subject to rules that preserve fundamental values such as safety and integrity. To do so will require defining best practices, coordinating to prevent regulatory arbitrage amongst governments, and cooperating to develop relevant standards.

7.   The OECD is currently developing work on how to: a) facilitate the efficient adoption of blockchain technology by governments; b) help governments identify effective policy responses to the risks and opportunities arising from use of blockchain by business; and c) help governments to prevent the misuse of blockchain for illicit activities.

8.   In this Hearing, the Competition Committee will consider whether the rise of blockchain technology is relevant to the work of competition authorities, and if so how. Below we set out a number of potential topics for discussion, and pose a number of questions to aid the discussion.

2. What is blockchain technology?

9.   Blockchain is described by the World Economic Forum as follows:[1]

Currently, most people use a trusted middleman such as a bank to make a transaction. But blockchain allows consumers and suppliers to connect directly, removing the need for a third party. Using cryptography to keep exchanges secure, blockchain provides a decentralized database, or "digital ledger", of transactions that everyone on the network can see. This network is essentially a chain of computers that must all approve an exchange before it can be verified and recorded.

In the case of Bitcoin, blockchain stores the details of every transaction of the digital currency, and the technology stops the same Bitcoin being (duplicated and) spent more than once.

The technology can work for almost every type of transaction involving value, including money, goods and property. Its potential uses are almost limitless: from collecting taxes to enabling migrants to send money back to family in countries where banking is difficult. Blockchain could also help to reduce fraud because every transaction would be recorded and distributed on a public ledger for anyone to see.

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[1] Rosamond Hutt, 2016: https://www.weforum.org/agenda/2016/06/blockchain-explained-simply/

Figure 1. Understanding Blockchain – Payment example
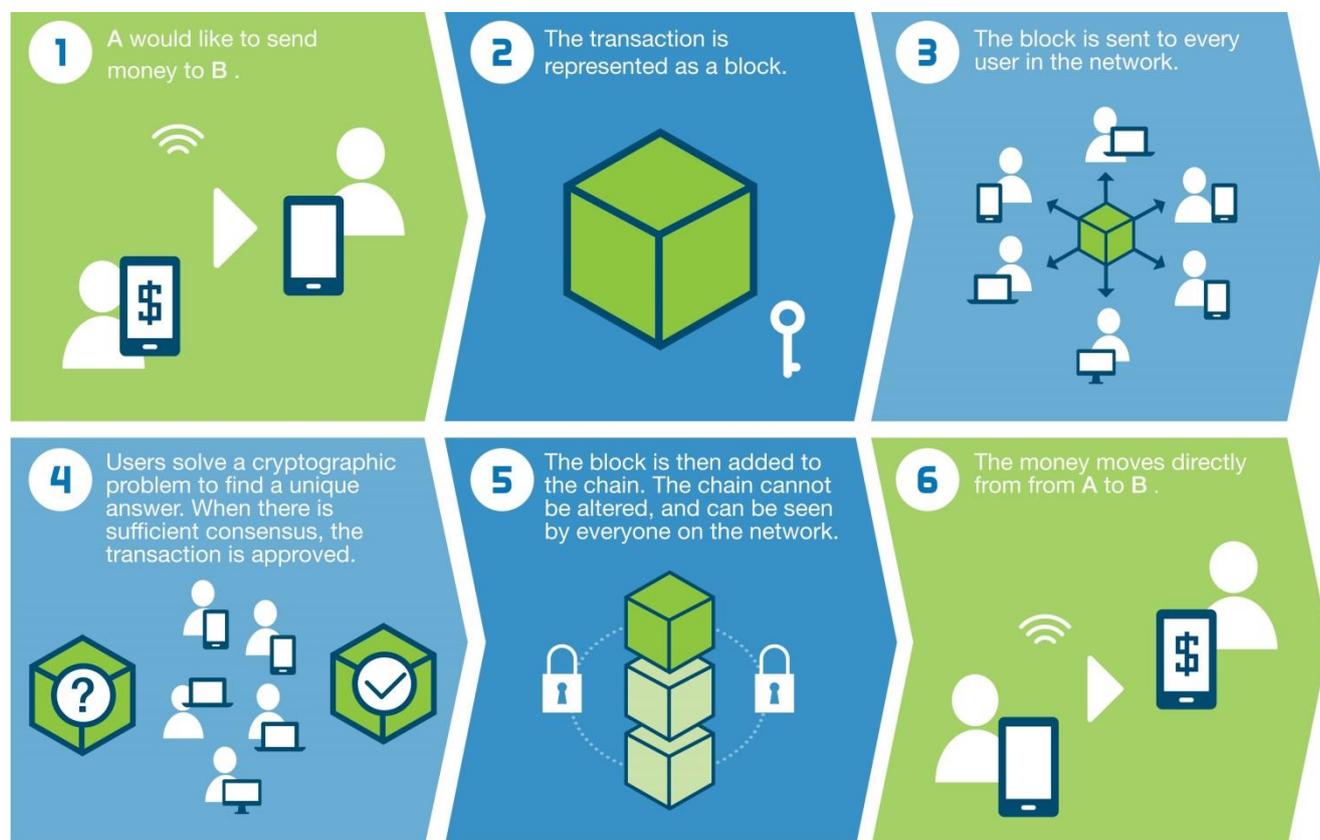
10.   At present, a number of consortia of competitors are collaborating to set up blockchains. Many of these are permissioned, rather than public blockchains like Bitcoin, see for example R3 (see Box 1).

Box 1. The R3 Consortium

"R3 is an enterprise software firm working with over 200 banks, financial institutions, regulators, trade associations, professional services firms and technology companies to develop on Corda, its distributed ledger platform designed specifically for businesses. R3's global team of over 140 professionals in nine countries is supported by over 2,000 technology, financial, and legal experts drawn from its global member base. R3 recently announced the successful completion of the first 2 of 3 tranches in a Series A fundraise valued at USD 107 million. Corda is the outcome of over two years of intense research and development by R3 and its members and meets the highest standards of the banking industry, yet is applicable to any commercial scenario. It records, manages and executes institutions' financial agreements in perfect synchrony with their peers, creating a world of frictionless commerce."

Source: https://txfblob.blob.core.windows.net/assets/Marco_Polo_20170220.pdf

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11. Blockchain Technology also offers the ability to put agreements, rather than transfers of ownership, onto a blockchain. These are known as smart contracts. This can have the advantage of creating trust that the agreement will be executed, in the same way that a blockchain creates trust that a transaction of Bitcoins will be executed. As with Bitcoin, these become traceable and irreversible. The Ethereum platform has become the most popular blockchain for allowing developers of applications to create these smart contracts (which are scripted in code rather than the legal text of a standard contract).

3. Potential issues for discussion

12. There are a range of possible ways in which blockchain technology might be relevant for antitrust and competition policy more generally. These include both risks and opportunities. The examples below are intended simply to give an illustration of possible antitrust issues and are not meant to be an exhaustive list.

3.1. Disruption in firms' business model

13. *Might blockchain technology disrupt and remove the need, not only for payment intermediaries (e.g. clearing and settlement, credit cards), but also for platforms?* By creating trust between transacting parties' blockchain technology potentially removes the need for intermediaries. This would reduce the costs of transactions and increase the efficiency of markets. In addition, if the key feature of a platform is its ability to crowdsource reviews of a supplier and build trust in that supplier, then blockchain technology might be a good substitute for that platform. This is because it can also provide trust in the origin of a product, and trust that the payment will arrive. This has led some to predict that blockchain technology will disrupt the platform business model. However, it is not clear at this stage how blockchain helps deliver another, perhaps more important role of a platform, which is to match the two or more sides of a market.

14. ***Might blockchain technology change the nature of some firms by reducing some of the transaction costs that explain why firms do not outsource more of their activities?*** The standard theory of the firm suggests that in order to carry out a transaction in a market it is necessary to discover who it is that you wish to deal with, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on (Coase). The development of the digital platform business model has reduced search and information costs, and while the costs of incomplete contracting are likely to remain significant (Grossman, Hart & Moore), blockchain technology might be expected to reduce the costs of contract enforcement. This might lead firms to outsource more, and to outsource new, previously core functions to specialised, and perhaps smaller, firms (even individuals). This could therefore create new and potentially highly competitive markets in a similar way to the disruption cause by the digital platform business model.

3.2. Access to data

15. ***Should competition agencies be given permission to access blockchains?*** This might enable them to monitor trading prices in real-time, spot suspicious trends, and, when investigating a merger, conduct or market have immediate access to the necessary data without needing to impose burdensome information requests on parties.

16. Similarly, easy access to the information on a blockchain for a firm's owners and head offices would potentially improve the effectiveness of its oversight on its own subsidiaries and foreign holdings. Competition agencies may assume such oversight already exists, but by making it easier and cheaper, a blockchain might make it more effective, which might allow for more effective centralised compliance programmes.

3.3. Collusion

17. ***Might there be potential for firms to collude through a blockchain?*** One possibility is that all the competitors within a market will use a single blockchain. Another possibility is that each firm will have its own blockchain(s) in the way that each firm has its own server space. Where a single blockchain is used by all, the potential transparency might help identify any deviation by cartel participants, and smart contracts might specify automated punishments for deviations. The transparency might also help to identify the terms on which to collude, for example, the price or market share.

18. ***Might there be potential for firms to tacitly coordinate through a blockchain?*** The potential transparency offered by a market-wide blockchain might also help firms in oligopolistic markets to coordinate tacitly without any direct or indirect contact, or any agreement to do so. Might full access to observe a market-wide blockchain constitute a 'plus-factor' that competition authorities might consider to suggest that parallel conduct was the result of coordination among the parties?

3.4. Abuse of dominance / unilateral conduct

19. ***Might blockchain technology be used to facilitate anti-competitive behaviour?*** There are a number of possible ways in which this might happen:

- ***Might there be cases in which incumbents seek to prevent or delay the efficient adoption of blockchain technology?*** For example by exaggerating the safety risks of the technology and lobbying for regulatory barriers that raise rival's costs.

Alternatively, might incumbents restrict merchants from charging consumers lower fees on blockchain transactions, and hence prevent merchants from steering consumers towards using blockchain payment methods. Such restrictions might limit the scale of new entrants that use blockchain technology, and hence raise their costs.

- *Might collaborations or consortia that set up blockchains exclude or raise the costs of rivals outside of the consortium?* If a consortium's blockchain is permissioned and access is controlled jointly by existing members of the consortia (known as gating), access might become an essential input to compete in the market. Refusal to access the blockchain might be used to exclude maverick firms or new entrants.

- *Might smart contracts provide a commitment device that allows firms to soften price competition?* As discussed above, smart contracts are codes that firms can write that can be trusted to self-execute if specified conditions unfold. This allows a firm to make a cheap but effective commitment, which might be useful for firms in a variety of settings. The ability to commit might be pro-competitive. For example, it may help resolve hold-up problems, such as when two parties would like to make relationship specific investments, but neither wants to go first and sink their investment since this would give the counterparty the ability to extract all the value created by the relationship. However, they might also allow firms to soften price competition. For example they might allow a firm to effectively commit to a price point by making it costly for it to move from that point. This might be done through low-price guarantees, most-favoured-nation clauses, or across platform parity agreements.

- *Might cryptocurrencies exploit dominant positions built upon network and platform effects by charging excessive transaction fees?* Cryptocurrencies that are built on blockchains are likely to be subject to both network and platform effects. Therefore if in the more distant future they do replace credit card companies, then one or two might gain market power not necessarily because their product is particularly different from another cryptocurrency, but as a result of the take-up of that product by other users. While this is unlikely to become an issue anytime soon, there may, in some jurisdictions, then be a question of whether they exploitatively abuse that market power, for instance by raising transaction fees charged by those that validate the blockchain. However, in these and other jurisdictions, authorities may prefer to use market studies to identify the features of the market that might lead to prices that appear excessive.

- *Might third parties exploit or exclude using a dominant position that depends upon blockchain related demand?* For example, firms that sell the specialised hardware that is required for mining tokens might find themselves with market power over inputs required by blockchain users that 'mine' the currency (by solving the cryptographic challenges required to validate the blockchain). These users might have few alternatives, and so might find themselves subject to excessive pricing in the absence of regulation. Alternatively, these firms might seek to leverage their market power in mining hardware into downstream markets.

3.5. Standard setting

20.   ***Might there be a need for those firms holding intellectual property that is essential to any relevant technical standards to commit to FRAND licensing?*** It might be that there is a need for a technical standard for interoperability to be defined by a standard setting organisation so that blockchains used by different firms can interact with one another (the International Standards Organisation is currently examining this).[2] In that case, there may be a need for royalty fees or FRAND licensing if the adopted standard requires specific intellectual property. This might lead to disputes between firms as in the case of standard essential patents (SEPs). In addition, there may be a need for data to be portable across different blockchains so that consumers can switch between them; we consider this further in the section on remedies below.

3.6. Competitive neutrality

21.   ***Might the principles of competitive neutrality be breached, and hence competition distorted, by policies that disadvantage or favour those firms that use blockchain technology?***

22.   For example, as part of an industrial strategy, policymakers might provide subsidies or indirect support to firms that adopt blockchain technology. There would then be a need to understand whether these subsidies distorted competition, either between firms using blockchain technology and others using alternative innovations, or with those using existing products or services that can be incrementally improved.

23.   Alternatively, firms using blockchain technology might suffer from an uneven playing field if there are regulatory restrictions that put them at a disadvantage. If regulation does not keep pace with the technology, it risks blocking its emergence, or failing to control the new risks that the technology brings with it. The timing of any changes that level the playing field may be important since start-ups might fold or sell to incumbents if change is too slow in arriving. Hence, should regulators consider a regulatory sandbox approach as a valuable tool?

3.7. Remedies

24.   ***Is there scope for competition agencies to use blockchain technology within the remedy packages they apply?*** We have recently seen technology being used to create more entrepreneurial remedy packages, for example in the UK's use of API (application programming interfaces) in its remedies in the retail banking and electricity markets. Might blockchain technology be used creatively in other remedies?

- ***Might smart contracts on a blockchain help consumers that wish to switch platforms without losing valuable network externalities that they gain from being members of the same platform as specific other users (e.g. their friends and family)?*** For example, this might allow each consumer to make and register their own individual switching decision that is then made conditional on certain criteria, such as their switching decision being matched by a certain number or proportion of their friends through a smart contract (or a certain price change or the arrival of a cheaper alternative). When a threshold is met, the smart contract

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[2] See ISO Technical Committee 307: https://www.iso.org/committee/6266604.html

would automatically switch the user and their group (friends and family), thus preserving the network effects between them. This might also incentivise others to follow, and help those that are keen to switch to a new platform but are discouraged from doing so due to the strength of the network effects on the incumbent platform.

- *Might blockchain technology be used to track the use and resale of the data generated by a consumer on a platform?* This might then enable the consumer to require payment from the platform for each re-use and combination of that data. This might create a market-compatible remedy if markets involving the sale of user data were not working effectively (for example following a market study or an exploitative abuse of dominance case).

- *Might there be a need for consumer data stored on one blockchain to be portable*? This would allow consumers to switch between services on different blockchains and to take their data with them.

- *Might competition agencies require firms to commit to behavioural remedy packages through use of smart contracts on a blockchain?* Depending on the nature of the commitments, this might remove the often-significant ongoing monitoring costs for authorities.

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